Trend Study 1-12-01

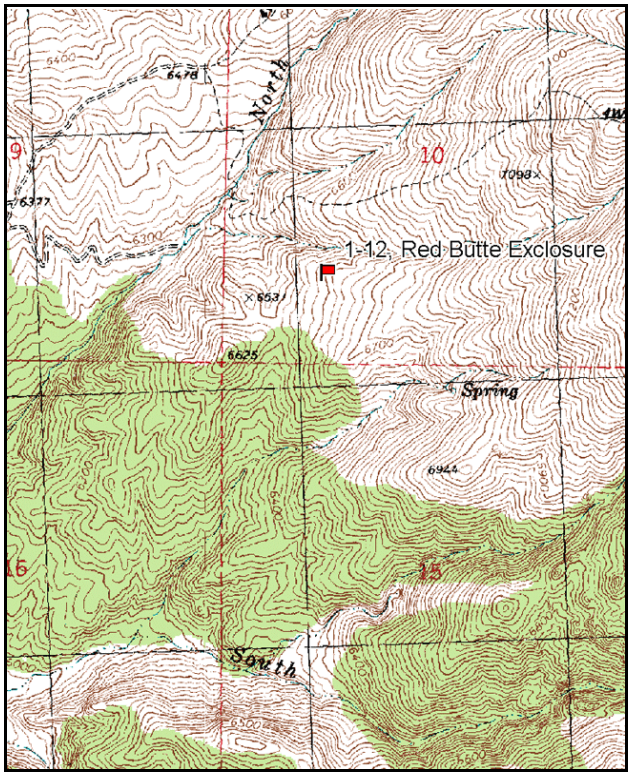
Study site name: Red Butte Exclosure . Vegetation type: Mountain Brush .

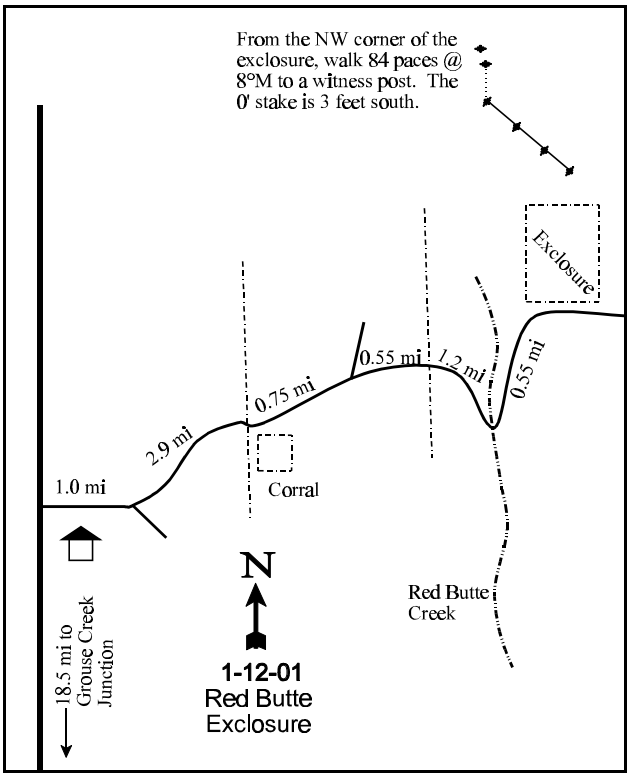
Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (59ft), line 3 (34ft), line 4 (71ft).

LOCATION DESCRIPTION

A four-wheel drive vehicle is needed to access this study. Proceed about 18.5 miles north from Grouse Creek Junction and turn right onto Ingham Canyon Road. Travel 1.0 miles to the first significant fork and turn left. Proceed 2.9 miles to a fence with a corral on the east side. Continue east and north for 0.75 miles to a fork and turn right. Proceed 0.55 miles to a fence. From the fence go 1.2 miles, staying right, to the bottom of the creek. From the creek, proceed up the dugway 0.55 miles to the southwest corner of the Red Butte exclosure. From the northwest corner of the exclosure, walk 84 paces at 8 degrees magnetic to the 0-foot stake of the baseline, which is marked by browse-tag #7915. Bearing of the baseline is 165 degrees magnetic and turns to 91 degrees magnetic.





Map Name: Ingham Canyon

Diagrammatic Sketch

Township 11N , Range 17W , Section 10

UTM 4618669 N, 268169 E

DISCUSSION

Trend Study No. 1-12

The Red Butte Exclosure study is located on the west slope of the Grouse Creek Mountains adjacent to the Red Butte exclosure. Elevation (6,540 ft.) is such that the study site constitutes "preferred" winter range. During most years it is used as a key "staging" area, where deer remain in fall and winter as long as snow conditions permit. As snow depths increase, deer migrate further south to Mud Springs Basin, Bovine, and Devils Playground. Vegetative and topographic characteristics suggest that spring use and fawning are also possibilities. The range type is basin big sagebrush-grass with significant associations with antelope bitterbrush, mountain Snowberry, and Saskatoon serviceberry. The study site has a gentle (15%) south to southwest facing slope. Deer use, as judged from pellet group frequency and browse utilization, appears light. Probably more significant is summer cattle grazing. Cattle were on the area at the time the study was established in 1984 and had already made a noticeable impact, especially on grasses and forbs. This area is within the Ingham allotment which is used from May 1 to September 15 by 802 cattle. A pellet-group transect read in conjunction with the vegetative transect in 2001 estimated light deer use at 21 days use/acre (53 deer days use/ha) and cow use at 2 days use/acre (4 cow days use/ha). Most of the deer pellet groups appeared to be from late winter and early spring use. Some sage grouse scat was also seen along the study site baseline but not sampled within the pellet group transect.

The soil is relatively deep and fertile with a sandy loam texture and a moderate amount of surface rock. Soil reaction is neutral (6.8 pH). Effective rooting depth estimates taken in 1996 averages just over 20 inches. The average soil temperature is 53°F at nearly that depth. Although numerous areas of bare ground are exposed, the thickness and permanence of vegetation and litter cover on the remaining area has prevented serious soil loss. The erosion condition is classified as stable for this site in 2001.

Shrubs are abundant and on average account for over 50% of the vegetation cover on this site. The key browse species for this site would be basin big sagebrush and bitterbrush which contribute to about 50% of the browse cover. Even though shrubs such as narrowleaf low rabbitbrush and mountain Snowberry are more numerous, the combination of big sagebrush and bitterbrush's relative palatability, larger size, and abundance are more vital to management. Of interest is an apparent mixture of sagebrush subspecies or ecotypes. Although the bulk of big sagebrush plants appear to be subspecies *tridentata,* there is a substantial portion (10%-20%) which more closely resembles the *vaseyana* subspecies. Utilization of sagebrush has been mostly might to moderate from 1984 through 1996 and light in 2001. The overall big sagebrush population has declined in density, but it is on average less decadent and displays better vigor than in 1984 or 1990. The percent dead in the population has remained about the same at 24-26%. Bitterbrush has remained fairly stable since 1996, with densities around 750 plants/acre, good vigor and mostly moderate use.

Populations of mountain snowberry and stickyleaf low rabbitbrush appear to have maintained fairly stable populations. Preferred shrubs such as bitterbrush and serviceberry occur in lower numbers and like almost all other shrubs, suffered some vole and pocket gopher damage in 1983-84.

Perennial grasses comprise an important part of the understory. Unfortunately, annual cheatgrass is the most abundant grass on the site. It accounted for 74% of the grass cover in 1996 and 66% of the grass cover in 2001. The most abundant perennial species is thickspike wheatgrass, an open sod former that tends to increase with heavy livestock use. Sandberg bluegrass is also fairly abundant. Other grass species occur much less frequently but almost all showed evidence of use during past readings. Perhaps most notable is Great Basin wildrye a robust bunchgrass, which although not encountered on the study plots, is obviously the most preferred grass species in midsummer.

The study site has a good mixture of forbs that includes a few conspicuous and desirable species in addition to larger numbers of less desirable ones. Showy forbs include: arrowleaf balsamroot, narrowleaf Lomatium, tapertip hawksbeard, and Penstemon.

1984 APPARENT TREND ASSESSMENT

Soil trend appears stable. Although there is some surface disturbance and exposed bare ground, the erosion rate is limited by a generally good vegetative and litter cover. Vegetative trend is more difficult to access. It appears that several undesirable increaser shrub, grass, and forb species are expanding. Although basin big sagebrush seems relatively stable, it is difficult to see how it can persist if species such as snowberry, low rabbitbrush, and western wheatgrass continue to increase in density.

1990 TREND ASSESSMENT

The soil condition appears stable, even with 30% cover of bare soil which hasn't really changed much since 1984. Narrowleaf low rabbitbrush is the most abundant shrub on this moderately high site. The big sagebrush population is essentially stable. The sagebrush shows light to moderate hedging but an unsatisfactory 53% decadency rate. However, this is lower than in 1984 when decadency was estimated at 60%. Bitterbrush has shown little changed except that percent decadency has declined from 50% to 25%. The bitterbrush is more heavily hedged but still maintains good vigor. Low rabbitbrush has not increased. There is a fair diversity of grasses and forbs. Thickspike wheatgrass and Mutton bluegrass both increased significantly in nested frequency. This increase would be expected on a high elevation site. Sum of nested frequency for forbs has also increased slightly. Sum of nested frequency for arrowleaf balsamroot has remained constant while the most numerous forb, long leaf phlox, has increased significantly. Trend for the herbaceous understory is considered up slightly.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - up slightly (4)

1996 TREND ASSESSMENT

The soil trend has improved due to a major decline in percent bare ground (30% to 6%) and an increase in litter cover (54% to 60%). Trend for the key browse species overall is stable. With basin big sagebrush and bitterbrush showing basically stable populations. Utilization is mostly light on both species and percent decadency has also declined. Changes in density of these two species is partly due to the larger sample used in 1996. Snowberry appears to have a stable trend also. The increaser, narrowleaf low rabbitbrush, shows a stable trend with the only major change being a reduced decadency rate (27% to 0%). Trend for the herbaceous understory is slightly down due to a decline in the sum of nested frequency for both perennial grasses and forbs. Thickspike wheatgrass declined significantly in sum of nested frequency. The majority of the decline in sum of nested frequency is due to significant declines in less desirable forbs including tapertip hawksbeard, larkspur, and longleaf phlox.

TREND ASSESSMENT
soil - up (5)
browse - stable (3)
herbaceous understory - slightly down (2)

2001 TREND ASSESSMENT

The soil trend is stable with only slight changes in cover. The ratio of bare soil to protective cover is still very good with values of more than 1 to 4. Trend for the key browse species, basin big sagebrush and bitter brush is fairly stable. Utilization is mostly light and percent decadency still remains within satisfactory limits. The increaser, narrowleaf low rabbitbrush, continues to show slight decreases in its density. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses declined slightly while frequency of perennial forbs has remained stable. However, the 2 key grass species, thickspike wheatgrass and Sandberg bluegrass have remained stable while annual cheatgrass has declined significantly. Cheatgrass still makes up 66% of the grass cover. The majority of the forb cover comes from two species, arrowleaf balsam root and the annual, blue eyed Mary. Both species have remained stable since 1996.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 01 , Study no: 12

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
G	Agropyron dasystachyum	$_{bc}$237	$_{c}$267	$_{ab}$185	$_{a}$176	89	95	67	64	2.44	3.51
G	Agropyron spicatum	$_{a}$-	$_{a}$-	$_{b}$21	$_{a}$-	-	-	8	-	.56	-
G	Bromus anomalus	-	-	-	3	-	-	-	1	-	.03
G	Bromus tectorum (a)	-	-	$_{b}$320	$_{a}$273	-	-	86	85	15.28	10.79
G	Koeleria cristata	2	-	5	-	1	-	2	-	.18	-
G	Oryzopsis hymenoides	-	-	8	4	-	-	3	1	.04	.03
G	Poa fendleriana	$_{a}$7	$_{b}$102	$_{a}$-	$_{a}$-	4	44	-	-	-	-
G	Poa secunda	$_{a}$47	$_{a}$47	$_{b}$91	$_{b}$92	23	23	38	43	2.19	1.93
G	Sitanion hystrix	-	1	13	5	-	1	4	2	.04	.03
G	Stipa comata	-	1	-	-	-	1	-	-	-	-
Total for Annual Grasses		0	0	320	273	0	0	86	85	15.28	10.79
Total for Perennial Grasses		293	418	323	280	117	164	122	111	5.47	5.54
Total for Grasses		293	418	643	553	117	164	208	196	20.75	16.34
F	Agoseris glauca	$_{b}$66	$_{ab}$43	$_{ab}$57	$_{a}$31	34	19	24	14	.15	.17
F	Allium acuminatum	$_{b}$94	$_{a}$36	$_{a}$21	$_{b}$107	50	17	12	49	.06	.42
F	Antennaria rosea	-	8	3	-	-	3	1	-	.15	-
F	Arabis spp.	-	1	10	-	-	1	5	-	.02	-
F	Astragalus beckwithii	$_{b}$13	$_{a}$-	$_{ab}$5	$_{ab}$8	5	-	2	4	.03	.21
F	Astragalus cibarius	$_{ab}$16	$_{b}$26	$_{ab}$25	$_{a}$7	7	13	11	3	.18	.07
F	Astragalus convallarius	-	2	-	-	-	1	-	-	-	-
F	Balsamorhiza sagittata	60	60	56	45	27	32	26	20	5.59	6.66

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'84	'90	'96	'01	'84	'90	'96	'01	'96	'01
F	Camelina microcarpa (a)	-	-	1	3	-	-	1	1	.00	.00
F	Chenopodium fremontii (a)	-	-	-	1	-	-	-	1	-	.00
F	Collomia linearis (a)	-	-	15	19	-	-	9	8	.04	.04
F	Comandra pallida	2	7	1	7	2	3	1	3	.00	.18
F	Collinsia parviflora (a)	-	-	217	230	-	-	78	71	1.45	5.28
F	Cordylanthus ramosus (a)	-	-	-	3	-	-	-	1	-	.15
F	Crepis acuminata	$_{b}$56	$_{b}$70	$_{a}$9	$_{a}$17	31	34	4	10	.02	.48
F	Cryptantha spp.	-	-	27	-	-	-	11	-	.08	-
F	Delphinium nuttallianum	$_{b}$22	$_{b}$18	$_{a}$-	$_{b}$21	15	10	-	11	-	.06
F	Descurainia pinnata (a)	-	-	-	2	-	-	-	1	-	.00
F	Eriogonum umbellatum	-	6	6	4	-	3	3	2	.18	.03
F	Gayophytum ramosissimum (a)	-	-	1	12	-	-	1	4	.00	.04
F	Gilia spp. (a)	-	-	-	-	-	-	-	-	-	.00
F	Haplopappus acaulis	-	-	7	-	-	-	2	-	.03	-
F	Hackelia patens	11	13	16	1	6	7	7	1	.14	.03
F	Holosteum umbellatum (a)	-	-	3	-	-	-	1	-	.00	-
F	Lappula occidentalis (a)	-	-	-	2	-	-	-	1	-	.00
F	Lithospermum ruderale	-	-	-	3	-	-	-	2	-	.01
F	Lomatium triternatum	$_{ab}$21	$_{b}$24	$_{a}$3	$_{b}$24	11	11	3	13	.01	.22
F	Lupinus argenteus	-	-	-	1	-	-	-	1	-	.03
F	Machaeranthera spp	-	-	4	-	-	-	2	-	.01	-
F	Microsteris gracilis (a)	-	-	-	92	-	-	-	39	-	.72
F	Phlox longifolia	$_{b}$154	$_{c}$217	$_{a}$81	$_{a}$54	68	80	34	23	.56	.46
F	Polygonum douglasii (a)	-	-	$_{b}$46	$_{a}$-	-	-	20	-	.10	-
F	Ranunculus testiculatus (a)	-	-	2	-	-	-	1	-	.00	-
F	Sedum lanceolatum	-	-	6	-	-	-	2	-	.01	-
F	Tragopogon dubius	$_{a}$-	$_{a}$-	$_{a}$-	$_{b}$3	-	-	-	1	.00	.03
F	Unknown forb-perennial	$_{ab}$4	$_{a}$-	$_{b}$13	$_{a}$-	3	-	5	-	.07	-
F	Veronica biloba (a)	-	-	3	8	-	-	1	3	.00	.06
F	Viguiera multiflora	-	-	8	11	-	-	4	4	.04	.04
Total for Annual Forbs		0	0	288	372	0	0	112	130	1.62	6.33
Total for Perennial Forbs		519	531	358	344	259	234	159	161	7.39	9.16
Total for Forbs		519	531	646	716	259	234	271	291	9.02	15.50

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 01 , Study no: 12

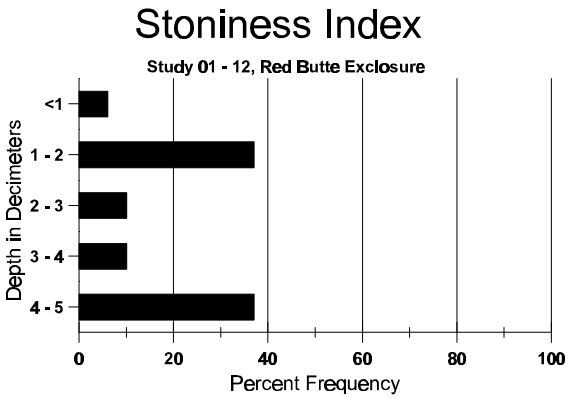
Type	Species	Strip Frequency '96	Strip Frequency '01	Average Cover % '96	Average Cover % '01
B	Amelanchier utahensis	3	1	.30	.00
B	Artemisia tridentata tridentata	48	51	9.52	8.38
B	Chrysothamnus nauseosus consimilis	2	1	.15	-
B	Chrysothamnus viscidiflorus viscidiflorus	76	73	6.46	6.42
B	Eriogonum microthecum	2	2	.15	.15
B	Opuntia spp.	49	45	3.35	2.71
B	Purshia tridentata	31	31	6.71	10.81
B	Symphoricarpos oreophilus	53	50	6.17	8.47
Total for Browse		264	254	32.82	36.95

BASIC COVER --
Herd unit 01 , Study no: 12

Cover Type	Nested Frequency '96	Nested Frequency '01	Average Cover % '84	Average Cover % '90	Average Cover % '96	Average Cover % '01
Vegetation	376	365	3.00	11.50	56.69	62.91
Rock	113	51	1.75	1.00	4.32	3.58
Pavement	205	168	3.00	2.50	4.30	4.63
Litter	389	373	59.25	54.25	59.50	47.27
Cryptogams	19	20	2.50	.75	.34	.25
Bare Ground	159	165	30.50	30.00	6.39	10.42

SOIL ANALYSIS DATA --
Herd Unit 01, Study no: 12, Red Butte Exclosure

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
20.3	52.6 (17.1)	6.8	68.6	15.4	16.0	2.6	20.7	201.6	.5



PELLET GROUP FREQUENCY --
Herd unit 01 , Study no: 12

Type	Quadrat Frequency		Pellet Transect	
	'96	'01	Pellet Groups per Acre 01	Days Use per Acre (ha) 01
Rabbit	-	2	-	-
Deer	6	7	278	21 (53)
Cattle	4	4	17	1 (4)

BROWSE CHARACTERISTICS --
Herd unit 01 , Study no: 12

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier utahensis																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	1	-	-	-	1	-	-	-	20	24	26	1
	01	-	1	-	-	-	-	-	-	-	1	-	-	-	20	27	26	1
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	1	-	-	1	-	-	2	-	-	-	40			2
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	-77%
'96	00%	33%	00%	-67%
'01	100%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	0	Dec:		0%
'90	266			0%
'96	60			67%
'01	20			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata tridentata																		
S	84	10	-	-	-	-	-	-	-	-	10	-	-	-	666			10
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	90	4	-	-	-	-	-	-	-	-	3	-	1	-	266			4
	96	9	-	-	2	-	-	-	-	-	11	-	-	-	220			11
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	84	6	4	-	-	-	-	-	-	-	7	-	3	-	666	33	33	10
	90	13	1	-	-	-	-	-	-	-	14	-	-	-	933	24	30	14
	96	34	6	-	4	-	-	-	-	-	43	1	-	-	880	28	35	44
	01	39	1	-	-	-	-	-	-	-	39	1	-	-	800	28	37	40
D	84	8	11	1	-	-	1	-	-	-	16	-	5	-	1400			21
	90	15	4	1	-	-	-	-	-	-	19	1	-	-	1333			20
	96	12	5	-	-	-	-	-	-	-	11	-	-	6	340			17
	01	19	-	-	4	-	-	-	-	-	15	-	-	8	460			23
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	420			21

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	43%	06%	23%	+ 8%
'90	13%	03%	03%	-43%
'96	15%	00%	08%	- 8%
'01	02%	00%	12%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	2332	Dec:		60%
'90	2532			53%
'96	1440			24%
'01	1320			35%

Chrysothamnus nauseosus consimilis																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	-	-	3	-	-	-	-	-	5	-	-	-	100	21	20	5
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40	21	30	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'96	00%	00%	00%	-60%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'84	0	Dec:	-
'90	0		-
'96	100		-
'01	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
S	84	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	84	16	1	-	-	-	-	-	-	-	17	-	-	-	1133			17
	90	21	3	1	-	-	-	-	-	-	25	-	-	-	1666			25
	96	14	-	-	3	-	-	-	-	-	17	-	-	-	340			17
	01	6	-	-	-	-	-	-	-	-	5	-	-	1	120			6
M	84	22	2	-	-	-	-	-	-	-	23	1	-	-	1600	11	10	24
	90	16	1	1	-	-	-	-	-	-	16	-	2	-	1200	15	17	18
	96	158	3	-	4	-	-	-	-	-	165	-	-	-	3300	17	27	165
	01	117	-	-	3	-	-	-	-	-	120	-	-	-	2400	15	19	120
D	84	11	9	-	-	-	-	-	-	-	19	-	1	-	1333			20
	90	11	3	2	-	-	-	-	-	-	15	-	1	-	1066			16
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	15	2	-	3	-	-	1	-	-	14	1	-	6	420			21
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	20%	00%	02%	
'90	12%	07%	05%	- 3%
'96	02%	00%	00%	- 7%
'01	01%	00%	05%	-19%

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	4066	Dec:	33%
	'90	3932		27%
	'96	3640		0%
	'01	2940		14%

Eriogonum microthecum																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	1	-	-	-	-	-	-	-	3	-	-	-	60	10	11	3
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40	10	17	2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'96	33%	00%	00%	-33%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	0	Dec:	-
	'90	0		-
	'96	60		-
	'01	40		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	3	1	-	-	-	-	-	-	-	4	-	-	-	266			4
	96	1	-	-	4	-	-	-	-	-	5	-	-	-	100			5
	01	7	-	-	2	-	-	1	-	-	10	-	-	-	200			10
M	84	24	-	-	-	-	-	-	-	-	24	-	-	-	1600	4	3	24
	90	5	-	-	-	-	-	-	-	-	4	-	1	-	333	4	10	5
	96	74	-	-	9	-	-	-	-	-	81	-	2	-	1660	5	16	83
	01	83	-	-	6	-	-	-	-	-	89	-	-	-	1780	4	12	89
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	3	-	-	-	-	-	-	-	-	-	-	3	-	200			3
	96	3	-	-	-	-	-	-	-	-	-	-	-	3	60			3
	01	5	-	-	-	-	-	-	-	-	1	-	-	4	100			5
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	-50%
'90	08%	00%	33%	+56%
'96	00%	00%	05%	+13%
'01	00%	00%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	1600	Dec:		0%
'90	799			25%
'96	1820			3%
'01	2080			5%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Purshia tridentata																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	01	1	2	-	-	-	-	-	-	-	3	-	-	-	60			3
M	84	-	1	1	-	-	-	-	-	-	2	-	-	-	133	11	13	2
	90	3	-	-	-	-	-	-	-	-	3	-	-	-	200	13	17	3
	96	17	14	1	2	-	-	-	-	-	34	-	-	-	680	24	47	34
	01	2	6	3	2	7	2	-	-	-	22	-	-	-	440	30	62	22
D	84	-	-	2	-	-	-	-	-	-	1	-	1	-	133			2
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	2	-	-	-	-	-	-	-	-	1	-	-	1	40			2
	01	2	1	1	4	3	-	-	-	-	11	-	-	-	220			11
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	25%	75%	25%	+ 0%
'90	00%	00%	00%	+66%
'96	36%	03%	03%	- 8%
'01	53%	17%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	266	Dec:		50%
'90	266			25%
'96	780			5%
'01	720			31%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	96	5	-	-	2	-	-	-	-	-	7	-	-	-	140			7
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	57	-	-	-	-	-	-	-	-	57	-	-	-	3800			57
	90	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	96	71	-	-	4	-	-	1	-	-	76	-	-	-	1520			76
	01	17	-	-	5	-	-	-	-	-	22	-	-	-	440			22
M	84	10	-	-	-	-	-	-	-	-	10	-	-	-	666	17	46	10
	90	6	1	-	-	-	-	-	-	-	7	-	-	-	466	10	15	7
	96	92	3	-	15	-	-	2	-	-	112	-	-	-	2240	17	38	112
	01	106	1	-	7	-	-	4	-	-	114	4	-	-	2360	19	38	118
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	1	-	2	-	-	-	-	-	-	2	-	-	1	60			3
	01	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	-88%
'90	25%	00%	00%	+86%
'96	02%	01%	.52%	-26%
'01	.70%	00%	.70%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	4466	Dec:	0%
	'90	532		0%
	'96	3820		2%
	'01	2820		1%